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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/339,199	06/24/1999	FUMIAKI NAKATAKE	21.1931/HJS	2308

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STAAS & HALSEY LLP
SUITE 700
1201 NEW YORK AVENUE, N.W.
WASHINGTON, DC 20005

EXAMINER

RAMSEY, KENNETH J

ART UNIT

PAPER NUMBER

2879

DATE MAILED: 10/22/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/339,199

Applicant(s)

NAKATAKE ET AL.

Examiner

Kenneth J. Ramsey

Art Unit

2879

-- Th MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 September 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3-9 and 11-38 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 9 and 34 is/are allowed.
- 6) ☒ Claim(s) 1,3,4,6,8,11,12,14,15,17,18,20,24,27-33,35-38 is/are rejected.
- 7) ☒ Claim(s) 5,7,13,16,19-21,25 and 26 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Response to Amendment

1. The amendments to the disclosure are approved since they clarify the meaning of the "softening point" of glass as used in the industry. The objection to the use of this term in the specification and claims is withdrawn in view of the citation and amendments.

Non-Prior Art Rejections

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claims 1, 3-8 and 27-33 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Specifically, claims 1, 27 and 31, recites that the lowering the pressure in the discharge space relative to the pressure on an exterior of the pair of substrates starts before the sealant starts to melt. However, paragraph 25 of the specification states that residual solid and gaseous impurities are exhausted from the discharge space via the leak clearance between the sealant and the substrate until the beginning of the sealant melting. Also, paragraph 39 of the specification states that the reduction of the interior pressure relative to the exterior pressure on the substrate is due to the melting of the of the sealant to close the gap

between the sealant and the substrate. Finally, paragraphs 56-59 explain that after the melting point of the glass sealant is reached the exhausting operation is continued via the pipe 5 until the internal pressure is around 50,000 to 70,000 Pa so that the internal pressure is less than that of the external pressure. Since as originally disclosed, the gasses are exhausted from the discharge space via the leak clearance until the melting of the sealant and since the external pressure does not become greater than the internal pressure until the gap closes due to sealant melting, the recitation that the internal pressure is lowered relative to the external pressure before the melting of the sealant starts is new matter. Claim 30 is also drawn to new matter since it recites that the exhausting of the pressure to lower the internal pressure relative to the external pressure continues until the seal glass layer begins to melt; however, as disclosed by the original specification, the internal pressure can not be lowered relative to the external pressure by exhausting the discharge space until after the sealant melts.

Prior Art Rejections

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1, 3, 8, 12, 14, 27-33, and 35-38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Seki et al (JP 09-251839) in view of Dynka et al (US 5,697,825) and JP 50 003570 (Okada). Seki discloses a process of sealing a plasma display device within a vacuum heating chamber in which the exhausting of the

discharge space, removal of impurities, sealing of the periphery of a pair of plasma display panel substrates, introduction of a fill gas and closing of the fill opening are carried out in a continuous process. While Seki et al, embodiments 1 and 3, appear to disclose a mechanical mechanism for applying pressure, the examiner notes that the pressure is applied only to the periphery only. Thus Seki must rely upon a pressure differential to obtain the fixed distance between the substrates at the center thereof. Okada confirms that it would have been obvious to rely upon a pressure differential to obtain the fixed spacing of the substrates in Seki. The mechanical mechanism of Seki appears to be primarily a means to increase the gap between the sealant and the upper substrate to allow a rapid evacuation of gas from the assembled display panel. One of ordinary skill in the art would have recognized that the use compressible protrusions in Dynka to initially space the pair of substrates similarly provides a flow path for evacuation of the substrates and removal of gases discharged from the sealant. It would have been obvious to provide the compressible protrusions of Dynka in the method of Seki in lieu of the mechanical spacing means since they provide a cheap alternative. As to claims 1, 27, 30 and 31, Seki paragraph 10 recites the step of exhausting the interior space to remove impurities at a temperature of 300-400 degrees before the sealant melts. After the sealant begins to melt, and the clearance gap closes, the internal pressure is lowered relative to the external pressure by raising the external pressure and/or by lowering the internal pressure. Seki includes a section headed "Effect" (see machine translation) that discloses the use of a pressure differential between the exterior and interior of the display panel to obtain a precise

spacing (opening) between the substrates (default value) at the time of sealing the two panel substrates together. Whether the pressure differential is achieved mainly by lowering the pressure in the discharge space as in Okada or by a temporary increase of furnace pressure per embodiment 3 of Seki, is a matter merely dependent upon one's view point. Both an increase of pressure in the furnace and the lowering of pressure in the discharge space have a role in the pressure differential value in Seki and there is no unobvious distinction between the two. If there were no lowering of the pressure in the discharge space while melting the sealant in Seki, there would be an inadequate pressure differential during the sealing of the substrates. As to claims 12 and 29, the height of the protrusions that provide a leakage path for the exhaustion of the discharge space involves a mere matter of degree with obvious results from adjustment. As to claims 8, 35 and 36, the use of fixing clips to initially hold the panels together prior to the melting of sealant is a well known expedient as shown by Seki, paragraph 0002 of the detailed description. As to claim 38, in the second embodiment, paragraph 0014 of Seki, the evacuation is stopped and an inert gas is admitted to cool the panel without raising the internal pressure above the external pressure, thereafter the sealed panel is further evacuated and the discharge gas is enclosed in the panel.

4. Claims 4 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Seki et al, Dynka, and Okada as applied to claim 1 above, and further in view of Murai et al (5,754,003). It is well known to form a color display panel by providing plural discharge electrodes on one substrate (20 and 12 of Murai) and providing the other substrate with fluorescent materials of a plurality of colors (column 10, lines separated

by a plurality of separator walls (28 and 18 of Murai). Since a color display is desirable, it would have been obvious for one of ordinary skill in the art to provide a plurality of fluorescent materials separated by separator walls on the substrate of Seki as above modified by Dynka and Okada.

5. Claims 6, 15, 17, 18, 20 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Seki et al, Dynka and Okada as applied to claim 1 above or over Seki, Dynka, Okada and Murai as applied to claim 4, further in view of Itoh et al (6,039,620). To carry out the process of Seki, as above modified by Dynka and Okada or by Dynka, Okada and Murai, wherein the substrates form a plurality of devices which are later divided as in Itoh et al would have been obvious to one of ordinary skill since it optimizes the production process by allowing the full capability of the vacuum furnace to be used as well as to reduce the amount of possible contamination prior to the sealing of the substrates. As to claim 15 and 24, it is further noted that Itoh et al teaches joining the conduction piping to a substrate of the display panel via glass frit 8 surrounding a through hole at the same time that the peripheral seals 8 are formed to provide separate hermetic display devices. It would have been obvious for one of ordinary skill in the art to join the piping of Seki as modified above by the secondary references by the same process since it reduces the number of heating steps. As to claims 17, 18 and 20, it would have been obvious to one of ordinary skill to maintain the differential pressure by keeping the interior of the display device at a lower pressure than the exterior thereof once the leakage path between the sealant and display substrates closes.

Allowable Subject Matter

6. Claims 5, 7, 13, 16, 19, 21-23, 25 and 26 would be allowable if rewritten or amended to be made self contained and to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action.

7. Claims 9 and 34 are allowed.

8. The following is a statement of reasons for the indication of allowable subject matter: Claims 5 and 34 are allowable since the prior art does not suggest the claimed process wherein, additionally, a barrier wall is provided to prevent an inward invasion of the melted sealant; Claims 7 and 9 are allowable since the prior art does not suggest the claimed process of claim 6 including connecting the evacuation tube to plural pipes which are each connected to through holes located in a portion of the panel so as to be adjacent to each other; Claim 13 is allowable since the prior art does not teach or suggest raising the pressure around the display panel at least once in the process of lowering the pressure before melting of the seal-glass layer. Claim 16 is allowable since the prior art does not teach or suggest locating the clips for pinching the plates together at inner portions of the plates so that interior portions of the plates are bowed inward relative to peripheral portions spaced apart by the height of the sealant. Claim 19 is allowable since the prior art does not teach or suggest the process of claim 15 further including exhausting the gas from the exterior of the substrates when the sealant reaches a temperature at which the degassing becomes active and ending the exhausting of the exterior of the plates when the sealant adheres to the substrates. Claims 21-23 are allowable since the prior art does not teach or suggest the process as

claimed therein including the step of controlling the pressure on the exterior of the sealant so that a bubble does not form in the sealant. Claims 24 and 25 are allowable since the prior art does not teach or suggest the process claimed in claim 20 including the inclusion of a heater in the seal-head for exhausting the discharge space to heat and melt a part of the conduction pipe after introducing the discharge gas into the discharge space via the conduction pipe.

Response to Arguments

9. Applicant's arguments filed September 11, 2003, have been fully considered but they are not persuasive. The argument that Seki fails to disclose that the lowering of pressure takes place before heating is noted; however, Seki discloses lowering of pressure in the discharge space while the temperature is well under the melting point. Seki further lowers the internal pressure relative to the external pressure on the substrate after melting of the sealant which is the same teaching as the applicant's disclosure. It is further noted that the lowering of pressure in Seki begins before the sealant melts as per the applicant's disclosure. The applicant further argues that the claims do not recite features of the prior art such as a mechanical substrate separator of Seki or the evacuation of the substrate before heating as in Dynka; however, it is immaterial what the claims do not recite. Moreover, the references do teach or suggest the limitations of the claims to one of ordinary skill in the art. Applicants argue features of the claims with the references considered individually. In response to applicant's

arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). Thus, with respect to claim 15, since the examiner's rejection relies upon Dynka for a teaching of stacking the substrates while separated by protrusions, in lieu of employing a mechanical separator as in Seki, applicants' arguments that Seki does not teach stacking is an improper argument. The further argument that Dynka and Okada do not teach heating the substrates to remove any impurities from between the substrates is clearly incorrect as well as an improper argument base upon features of the references individually. The argument is immaterial since Seki clearly teaches heating to remove impurities between the substrates. The limitations of new claim 38 are addressed in the above rejection.

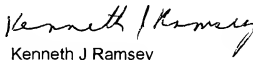
Conclusion

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

11. A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

12. Any inquiry concerning this communication should be directed to Kenneth J. Ramsey at telephone number 703-308-2324. If the examiner is not available, the examiner's supervisor, Nimesh Patel, can be reached at 703-305-4794.


Kenneth J Ramsey
Primary Examiner

kjr
October 20, 2003